GOVERNMENT OF THE GOLD COAST.

Report

ON THE

MEDICAL AND SANITARY DEPARTMENTS

FOR THE YEAR

1919.

GOLD COAST:

GOVERNMENT PRESS, ACCRA.

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CONTENTS.

ANNUAL REPORT FOR THE YEAR ENDING DECEMBER 31ST, 1919.

I. ADMINISTRATIVE.

1. MEDICAL STAFF 31ST DECEMBER, 1919.

1 Principal Medical Officer.
1 Deputy Principal Medical Officer.
1 Senior Sanitary Officer.
2 Provincial Medical Officers.
6 Senior Medical Officers.
2 Junior Sanitary Officers.
1 Pathologist.
38 Medical Officers, 4 of whom are Medical Officers of Health.
14 Vacancies { 10 Medical Officers. 2 Native Medical Officers. 2 Medical Officers of Health.
1 Inspector Chemist.
5 Superintending Sanitary Inspectors (1 vacancy).

EUROPEAN NURSING STAFF.

3 Senior Nursing Sisters.
6 Nursing Sisters.
1 Nursing Sister seconded to Lome.

PRINCIPAL MEMBERS OF SUBORDINATE STAFF.

1 Chief Clerk.
1 First Class Clerk.
4 Second Class Clerks.
8 Third Class Clerks.
3 Temporary Clerks.
1 Messenger.

Dispensing Staff.

1 Chief Dispenser.
4 First Class Dispensers.
12 Second Class Dispensers.
11 Third Class Dispensers.
1 Laboratory Assistant.

Native Nurses.

6 Second Class Nurses.
26 Third Class Nurses.
32 Nurses.

Lunatic Asylum.

1 Chief Attendant.
1 Assistant Attendant.
10 Attendants.
1 Matron.
1 Gatekeeper.

PRINCIPAL MEMBERS OF SUBORDINATE STAFF OF THE SANITATION BRANCH.

1 First Class Clerk.
2 Second Class Clerks.
3 Third Class Clerks.
1 Messenger.
3 First Class Sanitary Inspectors.
11 Second Class Sanitary Inspectors.
31 Third Class Sanitary Inspectors (4 vacancies).
2 Female Sanitary Inspectors.
1 Disinfector Mechanic.
1 Storekeeper.
8 Attendants for Contagious Diseases Hospitals.
4 Vaccinators (1 vacancy).
1 Third Class Clerk to Deputy Registrars of Deaths.
2 Clerks to Deputy Registrars of Deaths.
18 Sextons.
2 Messengers.

2. FINANCIAL.

(*a*) STATEMENT OF REVENUE FOR THE YEAR 1919.

Revenue (Hospital fees)	£1,882 7 2

(*b*) STATEMENT OF EXPENDITURE FOR THE YEAR 1919.

Medical Department (including Sanitary Branch)—	
Personal Emoluments	£50,977 9 0
Other Charges	69,422 9 3
Total	£120,399 18 3

II. PUBLIC HEALTH.

(*a*) GENERAL REMARKS.

3. The following table shews the most noteworthy contrasts in the returns of diseases treated during the years 1917, 1918 and 1919 :—

	1917.	1918.	1919.
Small-pox	25	5	23
Chicken-pox	341	582	121
Dysentery — Amœbic	9	16	18
Dysentery — Bacillary	—	—	7
Dysentery — Type undiagnosed	510	400	433
Enteric Fever	10	6	9
Influenza	280	7,756	135
Malaria Tertian	508	825	645
Quartan	25	84	42
Aestivo-autumnal	1,686	354	460
Chronic	168	67	145
Blackwater	24	17	20
Fever unclassified	1,096	1,834	2,446
Measles	82	80	14
Pneumonia	236	356	277
Rheumatic Fever	17	9	11
Sleeping Sickness	13	10	14
Whooping Cough	262	120	72
Alcoholism	17	25	25
Yellow Fever	5	3	10
Tuberculosis	261	239	269
Plague	6	—	—

4. *Dysentery.*—The number of cases of Dysentery observed shews a slight increase and the deficient staff accounts for the large proportion unclassified.

5. *Malaria.*—The returns shew 3,758 patients suffering from this affection ; a considerable increase on the number treated in 1918.

Twenty cases of Blackwater Fever are recorded, 8 of which ended fatally.

6. *Yellow Fever.*—Ten patients suffering from this disease came under observation of whom five were Europeans and five natives ; in four of the former and two of the latter death resulted.

7. *Tuberculosis.*—The number of cases treated was 269 as compared with 239 in the previous year.

Although there is only a small increase in the number of these cases recorded the idea appears prevalent that this disease is distinctly on the increase.

8. *Guinea-Worm.*—Sixty-seven patients were treated in Accra of whom the large proportion were infected elsewhere ; the remaining cases may have resulted from use of the water in some of the wells which still remain in the town.

9. *Cestoda.*—There has been an increase of over 100 per cent. in the number of patients seeking treatment for these infections. This is possibly the result of the increase of the means to supplement the flesh content of their diet.

(b) EUROPEAN OFFICIALS.

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES OF EUROPEAN OFFICIALS.

	1917.	1918.	1919.
Total number of Officials resident	597	515	653
Average number resident	489	413	522
Total number on Sick List	534	656	396
Total number of days on Sick List	4,582	5,987	3,210
Average daily number on Sick List	12·5	16·4	8·8
Percentage of Sick to average number resident ..	2·55	3·97	1·69
Average number of days on Sick List for each Patient	8·58	9·12	81 0
Average sick time to each resident	9·37	14·49	6·15
Total number Invalided	19	54	28
Percentage of Invalidings to total residents ..	3·18	10·48	4·29
Percentage of Invalidings to average number resident	3·88	13·07	5·36
Total Deaths	9	6	6
Percentage of Deaths to total residents	1·50	1·16	0·92
Percentage of Deaths to average number resident	1·84	1·45	1·15

The total number of days on the sick list, 3,210 shews a very considerable decrease over the previous two years :—

DAYS OFF SICK LIST.

Causes.	1917.	1918.	1919.
Tropical Diseases	2,550	2,584	1,446
Non-tropical Complaints	2,037	3,403	1,764
Totals	4,587	5,987	3,210

10. *Causes of Invaliding of European Officials.* Blackwater fever (3), anæmia (2), debility (2), ulcerated hæmorrhoids (1), infective phlebitis (1), chronic bronchitis (2), neurasthenia (4), psoas abscess (1) climatic bubo (1), cardiac irregularity (1), cystitis (1), gastritis (2), malaria remittent (1), malignant tertian malaria (1), neuritis (1), renal colic (1), typhoid fever (1), urethral stricture (1), stiff knee joint (1) ; total 28.

The following table shews, in periods, the approximate length of tour of those invalided :—

INVALIDINGS—EUROPEAN OFFICIALS.

8 months and under.	..	..	.. 11
10—15	„ ..	.. ..	 15
17—21	„ ..	.. ..	 2

Of the total of 28 invalided, nine were military officers and 19 were civilians.

The invaliding rate, 42·9 per 1,000 shews a marked decrease on that of the previous year:—

	1917.	1918.	1919.
Invaliding Rate	31·8	104·84	42·9

11. *Causes of Deaths of European Officials.*—Chronic gastritis (1), fracture of base of skull (1), influenza septic peritonitis (1), blackwater fever (1), yellow fever (1), liver abscess (1); total six.

(*c*) NATIVE OFFICIALS.

Table showing Sick, Invaliding and Death Rates of Native Officials.

	1919.	1918.	1919.
Total number of Officials resident	1,931	2,158	2,122
Average number resident	1,882	2,041	1,739
Total number on Sick List	765	1,321	488
Total number of days on Sick List	6,228	13,520	4,372
Average daily number on Sick List	17	37	12
Percentage of Sick to average number resident ..	0.90	1.81	0.69
Average number of days on Sick List for each Patient	8.1	10.23	8.95
Average sick time to each resident	3.30	6.62	2.51
Total number Invalided	8	8	18
Percentage of Invalidings to total residents ..	0.41	0.37	0.85
Percentage of Invalidings to average number resident	0.42	0.39	1.04
Total Deaths	12	44	10
Percentage of Deaths to total residents	0.62	2.03	0.47
Percentage of Deaths to average number resident	0.63	2.15	0.58

12. *Causes of Invaliding of Native Officials.*—Deafness (1), pulmonary tuberculosis (7), presbyopia (1), ankylosis of knee joint (1), insanity (1), hemiplegia (1), myopia (1), chronic rheumatism (1), diabetes (1), urethral stricture (1), dementia (1), cerebral hæmorrhage (1); total 18.

13. *Causes of Deaths of Native Officials.*—Pernicious anæmia (1), rheumatic fever (2), acute ethylism with heart failure (1), meningitis (1), malaria remittent (1), pulmonary tuberculosis (3), hemiplegic pernicious malaria fever (1); total 10.

(*d*) GENERAL EUROPEAN POPULATION.

(i.) Government Officials	653
(ii.) Employés of Trading Firms	1,902
(iii.) Employés of Mining Companies	561
(iv.) Missionaries	66
Total	3,182

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES OF EUROPEAN NON-OFFICIALS.

How employed.	Number.	Deaths.	Invalided.	Death rate per cent.	Invaliding rate per cent.
1917.					
Merchants	718	11	45	1·53	6·26
Mining Companies ..	718	6	48	0·83	6·68
Missionaries	139	1	2	0·72	1·44
Totals	1,575	18	95	1·14	6·03
1918.					
Merchants	681	19	26	2·79	3·81
Mining Companies ..	578	29	21	5·01	3·63
Missionaries	49	2	—	4·08	—
Totals	1,308	50	47	3·82	3·59
1919.					
Merchants	1,902	15	20	0·79	1·05
Mining Companies ..	561	7	25	1·24	4·45
Missionaries	66	—	1	—	1·51
Totals	2,529	22	46	0·87	1·82

14. *Causes of Invaliding of European Non-Officials.*—Blackwater fever (7), phthisis (1), climatic bubo (2), prostatitis (1), hepatitis (1), cystitis (1), cirrhosis of liver (1), nephritis (1), fibrositis (1), delirium tremens (1), malaria (6), gonorrhœa (1), neurasthenia (2), alcoholism (2), dysentery—bacillary (1), nervous breakdown (3), pleurisy (1), syphilis (2), anæmia (1), yellow fever (1), blackwater fever (2), cervicitis (1), catarrhal jaundice (1), kala-azar (1), debility (2), chronic rheumatism (1), unable to bear climate (1); total 46.

15. *Causes of Deaths of European Non-Officials.*—Blackwater fever (7), pneumonia (2), drowned (1), yellow fever (3), encephalitis lethargica (1), dysentery bacillary (2), mania (acute) (1), pernicious anæmia (1), enteritis (1), thermic fever (1), cirrhosis of liver (1), meningitis (1); total 22.

EUROPEAN MORTALITY AND INVALIDING RATES, 1919.

Total Strength.	Deaths.	Invalidings.	Death rate per 1,000	Invaliding rate per 1,000
Official 653	6	28	9·20	42·88
Non-Official 2,529	22	46	8·70	18·19
Totals. 3,182	28	74	8·80	23·26

III.—SANITATION.

A.—GENERAL REVIEW OF WORK DONE, LAWS PASSED, AND PROGRESS MADE.

(i) Administrative.

The sanitary organization has been satisfactorily maintained and routine work has been fairly well carried on. The year under review, however, must be classed with its predecessors during the war in respect of shortage of staff and materials, while labour troubles and unrest in the later months added to the difficulty.

The European Staff was short throughout the year to the extent shown below.

The vacant post of Senior Sanitary Officer was well filled by the Medical Officer of Health, Accra, until the arrival of the new holder in September.

One Junior Sanitary Officer was on duty from April onwards, but was acting Medical Officer of Health as well at Coomassie.

The other Junior Sanitary Officer was absent on other service throughout the year.

Medical Officers of Health were stationed at Accra, Seccondee, and Coomassie, throughout the year, but in Accra the duties were carried on in addition to those of Acting Senior Sanitary Officer from January to September, and in Coomassie a Junior Sanitary Officer acted as Medical Officer of Health from April to the end of the year. At Cape Coast several Medical Officers acted as Medical Officers of Health until the end of October, when the vacancy was filled by a fresh appointment.

Two vacancies for Medical Officers of Health are still unfilled. Superintending Sanitary Inspectors were available for Accra and Seccondee throughout the year; as in the previous year, the posts of Municipal Sanitary Inspectors under the Town Councils, being still vacant, added to their duties. In Coomassie and Cape Coast, a European was available for only a short period. In this branch, one Superintending Sanitary Inspector has been seconded for military service since 1914, and one vacancy has remained unfilled since 1918.

Under these circumstances, the Native Staff, themselves under-manned, worked under less supervision than could be desired, but worked creditably on the whole.

Tours of inspection could not be carried out but a few necessary visits were made. The Acting Senior Sanitary Officer visited Saltpond in March after an outbreak of Yellow Fever; a brief visit was made to Seccondee Water Works in September; a short tour including visits to Winnebah, Saltpond, Cape Coast, Elmina and Seccondee, was accomplished towards the end of the year.

The Medical Officers of Health at Seccondee and Coomassie visited the towns and railway stations in their districts. The rapidly developing cocoa and railway districts, with extension and improvement of motor roads, bring forward new problems of sanitation for the benefit of the increasing number of small towns and growing villages. For the majority of them, sanitary control is lacking at present, and the need is great for additional inspectors and labour.

No special feature distinguishes the year under review, except a comparative drought, and the occurrence of an epidemic of Cerebro-spinal Fever in the Northern Territories. The rainfall in Accra was 20·4 inches, as compared with an average of 32 inches for the previous 12 years 1907 to 1918 inclusive.

Ordinances, &c.—"The Vaccination Ordinance, 1919," was passed before the end of the year, and comes into force in the areas to which it may be applied on 1st January, 1920. It is more elastic than the previous Ordinance, and better suited to the present needs.

The following Orders-in-Council, Rules, etc. (besides a few others of local reference only) were made under existing enactments:—

Under the Infectious Diseases Ordinance, No. 2 of 1908:—

Order by the Governor No. 2 of 1919	Appointing a Compensation Board in connection with Order-in-Council No. 1 under the Quarantine Ordinance.
Order in Council No. 38 of 1919	Declaring Influenza to be an infectious disease within the meaning of the Ordinance.

Under the Quarantine Ordinance, 1915 :—

Order by the Governor	No. 1 of 1919 ..	.. Declaring Saltpond an infected place.
,, ,, ,,	No. 6 of 1919 ..	.. Rescinding the above.
,, ,, ,,	No. 9 of 1919	.. Declaring Lagos an infected place by reason of Small-pox.
,, ,, ,,	No. 12 of 1919 ..	.. Revoking the above.
,, ,, ,,	No. 20 of 1919 ..	.. Declaring Dakar an infected place by reason of Plague.

Under the Towns Ordinance, 1892 :—

Order-in-Council	No. 1 of 1919	.. Defining boundaries of Town of Appam.
,, ,, ,,	No. 8 of 1919	.. Defining boundaries of Town of Huhunyah.
,, ,, ,,	No. 9 of 1919	.. Defining boundaries of Town of Adeiso.
,, ,, ,,	No. 17 of 1919	.. Defining boundaries of Towns of Angu and Ashieme.

Under the Customs Ordinance, 1876 :—

Order-in-Council	No. 25 of 1919	.. Prohibiting importation of dogs in order to prevent introduction of Rabies.

Under the Public Lands Ordinance, 1876 :—

Notices of land required for extension of Segregation Areas at Appam, and Nsawam.

Under the Births, Deaths and Burials Ordinance, 1912 :—

Proclamation No. 11 of 1919 and as amended by Proclamation No. 14 of 1919	Declaring Government Cemetery at Aburi a Public Cemetery.
Proclamation No. 36 of 1919	.. Declaring the Mohammedan Cemetery at Accra a Public Cemetery.

Under the Diseases of Animals Ordinance, 1918 (as applied to Ashanti) :—

Regulation 4 of 1919	.. "The Registration of Cattle in Coomassie Regulations, 1919."

Under the Ashanti Administration Ordinance, 1902 :—

Rule 1 of 1919	.. "Rules for Abatement of Nuisances in the Town of Coomassie."
Executive Order	.. "Rules for Residents in Segregation Areas of the Gold Coast."

(ii.) Preventive Measures Against—

(1) Insect-borne diseases.

(*a*) *Malaria, Yellow Fever, etc.*—As in previous years work directed towards mosquito-reduction and prevention forms a large part of the efforts of Sanitary Inspectors and labourers. The usual routine measures have been faithfully carried out, the comparative dryness of the year being in favour of the workers in their out-door efforts, but tending to encourage domestic storage of water. Nevertheless, in October, a surprising access of mosquitoes was experienced in Accra, traceable to the marshy edges and environs of the lagoon to windward of the town and to the outfalls of the main drains, which, in a period of drought, reach the lagoon through stagnant channels in the grass, conditions which do not lend themselves to effective action on a small scale. An accessory brief invasion of mosquitoes from the east about the same time was traced to the smaller lagoon at Christiansborg, the margins of which were found to be a mass of larvae of one species only, *viz.*, *Culex Thalassius*, a breeder in brackish water. This was promptly remedied by cutting an opening to the sea and attention to the margins. The two instances illustrate the difficulty and the ease respectively of treating different local sources of mosquitoes.

Again in Accra the comparative rarity of Anopheline larvæ and adults, and the comparatively small number of the latter found by the Pathologist to be infected at a period when quite half the native population exhibited on a single examination Malaria parasites in the blood, indicates the need for a careful local study of the bionomics of the Anopheles, lest too much be taken for granted, and pre-conceived notions obscure the lines on which fresh action may be required.

All the methods adopted in previous years, draining, filling, clearing, oiling, protection of tanks, barrels and wells, treatment of roof-gutters and holes in trees, etc., straightening streams and improving their banks, have been vigorously conducted. Outdoor mosquito-brigades were maintained, and fumigation of houses, &c., done in special cases.

Yellow Fever.—Regular and systematic house to house inspection is the main defence against *Stegomyia fasciata.*

At Winnebah a European died of Yellow Fever on 8th January, and the probable place of infection was found to be Saltpond, where, in the same house on 17th January, two other European cases were diagnosed. Of the latter one died.

Saltpond was declared infected and ships at that port were worked under Quarantine Regulations, so as to hamper trade as little as possible at other ports.

Vigorous anti-mosquito action was taken, along with house inspection for suspected cases ; non-immune Europeans were removed, and extensive fumigation of the whole neighbourhood was done by use of the Clayton Machine from Cape Coast.

Six other cases occurred in February, March, May and September (five native, one European) of which three were fatal including one European.

The Acting Senior Sanitary Officer paid a visit to Saltpond in March, and in June a Medical Officer was detailed to visit and report.

The acute shortage of water (in January actually quarter rations were suggested) leading to the use of numerous uncovered receptacles for storage, and the impossibility under these circumstances of justifying emptying of pots according to the usual anti-mosquito regulations, along with the insanitary state of the lagoon margins, readily accounted for the insect side of the question being favourable to an outbreak. Endemicity is the other factor and it needs no farther corroboration than a reference to previous history.

The engineering treatment of the Saltpond lagoon is provided for in the programme of major works for 1920, and an increase of the Sanitary Staff is arranged for, as soon as men are available.

In the flat country behind Lome, in Togo, two fatal European cases occurred, one in March and one in May. A Medical Officer detailed to visit and inquire reported the place of infection as probably Asahun, a station on the railway, and described the conditions favouring endemicity throughout the region, where the poor physique of the natives is probably attributable to generations of exposure to this disease. In that region the water supply is particularly precarious, and the people depend on storage in large jars, and on shallow wells or water holes in the absence of permanent streams ; stray receptacles litter the environs of the towns, and no attempt at segregation of Europeans on the line of railway had been made. The whole area possesses a well defined " Yellow Fever tradition," which is confirmed by reference to Dr. G. E. H. Le Fanu's " Report on the Medical and Sanitary Administration in Togoland," in 1912. This region probably passes into the French Administration.

(*b*) *Pappataci Fever.*—Three cases of this were discovered at Saltpond during the outbreak of Yellow Fever there in January. The diagnosis naturally required nice discrimination but was skilfully determined by the Medical Officer. Species of Phlebotomus are widely distributed over the Gold Coast.

(*c*) *Trypanosomiasis.*—No particular incidence of this is to be noted. One case was recorded from Axim and another in Kwahu district, and three deaths from this cause were registered at Coomassie. Clearing of bush in townships and at river crossings, etc., is constantly carried out.

(2) Infectious and Epidemic Diseases.

Enteric Fever.—This disease, either as true Typhoid, or Paratyphoid, is probably more prevalent in the coast towns than comes to light in the returns. Cases with the clinical symptoms and course are not infrequent amongst natives, and more complete facilities for a laboratory diagnosis would probably confirm the suspicion in many cases. The disease is not at present on the list of "Infectious Diseases" under the Ordinance. Prevention concerns itself chiefly with proper methods of sewage disposal and reduction of flies.

Dysentery and *Diarrhœa* are amongst the commonest diseases shown on returns. Personal habits of uncleanliness in regard to hands, utensils, and food, may often account for infection of the individual, and carriers of the germ of Amœbic Dysentery must be abundant without necessarily showing symptoms.

In general the lines of prevention are improvement of water-supplies, closure of polluted wells, proper disposal of sewage and refuse, prevention of fly-breeding, and personal cleanliness.

Chicken-pox occurred in small outbreaks at Cape Coast, Tarquah, Winnebah, Sunyani, and in the Birrim district of the Eastern Province where it was reported as *Small-pox.*

Krooboys form the majority of those cases which come to notice, and its chief importance is the possible confusion of the rash with that of Variola.

Opportunity is taken to push vaccination.

Small-pox.—Five cases occurred, with two deaths, at Lorha a district which had previously been visited by an epidemic in 1917 and 1918. Several thousand vaccinations were performed.

In September again, 18 cases with nine deaths occurred in the Lorha, Wa and Tumu districts. Over 14,000 vaccinations were performed. Of those performed by the Medical Officer himself (and verified) 64 per cent. were successful. After these experiences the people of the district are more than willing to accept vaccination.

Vaccinations.—The number of vaccinations performed during the year was 21,467, of which 16,943 were verified as successful or 78.9 per cent; cases not verified are classed as unsuccessful.

A table for comparison with previous years is given below.

Vaccinations—1914 to 1919.

	1914.	1915.	1916.	1917.	1918.	1919.
Total number vaccinated	7,631	9,723	10,313	21,293	14,700	21,467
„ „ successful	5,417	7,270	7,848	15,619	10,726	16,943
Percentage successful	71	74·7	76	77·3	73	78·9

The percentage successful, as recorded from the different stations, varies from 93 per cent. at Winnebah and 90 per cent. in Accra, to 41 per cent. at Tarquah (where however a large proportion are not seen for verification). Stations at a distance from Accra and Seccondee, the two distributing centres of vaccine lymph arriving from England, are at a disadvantage in respect of preservation of the potency. A certain quantity of dried lymph is used in Coomassie.

Anthrax.—Some consignments of cheap shaving brushes supplied to a mercantile firm were withdrawn from sale on information from the Secretary of State that the original stock had been found to be infected. Samples examined at the Laboratory in Accra showed a bacillus resembling the *B. anthracis* but the biological reactions were uncertain. No cases were reported. Those still unsold were collected and destroyed by fire.

Plague.—A single case, pneumonic in type, was discovered by autopsy in a young Krooboy resident in Accra who died on 8th July.

A careful inquiry revealed no evidence of the source of infection.

The preventive measures taken were disinfection of premises, inspection of contacts, (temperature taken twice daily for 6 days) and concentration of rat-trapping in the locality. None of the rats examined showed infection, and there was no history of rat prevalence or mortality. No other cases occurred and no special incidence of Pneumonia or Influenza was observed.

A severe outbreak of Bubonic Plague at Dakar in French Senegal commencing in September led to defensive measures at Gold Coast ports.

The French Authorities declared the port of Dakar infected on 23rd October, and Medical Officers of Health acted on full Quarantine Regulations; an Order by the Governor under section 2 of the Quarantine Ordinance was issued on 13th November declaring Dakar to be an infected place until restrictions were raised on 19th December.

In order to be further prepared 5,000 doses of Haffkine's Prophylactic Vaccine were obtained from England.

No cases were reported in the Gold Coast.

Increased measures of rat-destruction at the coast ports were encouraged, and Sanitary Inspectors were instructed in the nature and symptoms of Plague with a view to prompt report of any suspicious case.

Influenza.—An outbreak of a mild type occurred from September to November. The districts affected were Coomassie—26 cases, Northern Territories—12 cases, Seccondee—69 cases, Saltpond—11 cases, Akuse (in the Eastern Province) 1 case—total 119 including five Europeans. There were three deaths in Seccondee, all natives.

In Coomassie 16 cases occurred amongst native troops just arrived from Northern Territories. Isolation and a cordon were applied, and arrangements made to delay the return of troops from outside the Colony. One European was infected in the town, and 10 natives.

At Seccondee, where the majority of cases were Krooboys, the preventive measures taken were to isolate in a selected Kroo-house those who were not sent to hospital, with disinfection, &c. Coastwise travelling was discouraged as far as possible, and native passengers examined before being allowed to proceed. Employers of labour assisted by reporting suspicious cases or sending them to hospital for diagnosis. Native Chiefs and headmen were instructed by the Provincial Commissioner.

To strengthen the hands of the Sanitary Staff *Influenza* was added to the list of Infectious Diseases under the Infectious Diseases Ordinance, 1908.

Cerebro-spinal Fever.—An outbreak of a virulent type occurred in the North-West Province of the Northern Territories from February to May. The first cases reported were at Lorha, early in February, and, by the middle of March, the disease had spread 20 miles, 18 miles, and 10 miles respectively along the main trade routes. The direction of the prevailing breeze, *viz.*, the dry and dusty Harmattan from the North-East, in a period of exceptional drought, was doubtless a factor in accelerating its spread. One of the first reported cases was at a caravan ferry on the Volta River, suggesting a direct connection with French Haut Sénégal where the disease was already epidemic.

With the advent of the rains in April the outbreak suddenly declined and all restrictions were raised in the first week in May.

Conditions favouring spread were the hot season when no farm work was being done, and when the Lobi people congregate to drink " peto ", (guinea-corn beer) inside their compounds which are peculiarly suited in construction to favour the spread of a disease which is largely communicated in circumstances of overcrowding and lack of ventilation.

Concealment of cases also was the rule during the early weeks, and a daily compound inspection revealed emaciated wrecks with bed-sores showing evidence of several weeks' illness. Nasal catarrh during the Harmattan is in any case a common condition amongst these people (to which the " peto " and snuff habits predispose), and, in addition, the *Influenza* epidemic probably still lingered at the time the Cerebro-spinal Fever outbreaks started.

These people had in recent times suffered from *Small-pox* in 1917—1918, *Influenza* from November 1918 onwards, and *Pleuro-pneumonia* had devastated their cattle in 1916.

Cerebro-spinal Fever was epidemic in the North-West Province of Northern Territories in the successive years 1906, 1907 and 1908, and the disease is to be regarded as really endemic, in that region at least, atypical or undetected cases (and unverified cases reported by administrative officers of sudden deaths amongst apparently healthy children) occurring at any time, with outbreaks in the dry season.

The preventive measures adopted were prompt and energetic.

The affected districts were closed by a cordon composed of Police Constables, ex-recruits of the Gold Coast Regiment and volunteers (Lorha district was thus cut off by a cordon of 800 men in less than 30 hours, and Wa and Tumu were similarly surrounded).

Most villages had isolation camps (21 large, 21 small) of temporary huts for the sick situated about 500 yards away, no one being allowed to leave or enter; food, water, etc., being placed outside, and attendants limited to elderly persons.

A searching compound inspection was very productive after the cordon was complete and seemed to have a definite effect in bringing about a decline in the epidemic.

Markets were stopped and restrictions put on funeral customs; caravans were forbidden to halt within the cordon and diverted to other routes.

The Chiefs were called in and instructed to report daily, cases and deaths.

The total number of known cases was 1,041 with 986 deaths, a case mortality of 94·8 per cent. (In the epidemic of 1907 the number of deaths was 8,000; in that of 1908 there were 6,000 deaths).

320 cases were admitted to isolation camps.

After the first fortnight the majority of cases were infants and young persons, and the recoveries recorded were, as is usual, chiefly in the concluding weeks.

A single fatal case occurred in Gambaga (North-Eastern Province of Northern Territories) in September, and another of a child at Saltpond in November; the latter was verified by post-mortem and microscope.

(3) Endemic Diseases.

Tuberculosis.—Although Pulmonary Tuberculosis is an "Infectious Disease" under the Ordinance it is not compulsorily notifiable, but departmental instructions have been given that cases treated by Government Medical Officers should be notified to Medical Officers of Health. At each station where there is a Medical Officer of Health a register is kept, and a schedule of enquiry is in use when a case is reported. The house is visited frequently, change of occupants noted, and instruction, advice, issue of printed leaflets, and disinfection carried out by the Sanitary Inspector in a friendly way. Search for other cases is made but no attempt to enforce isolation if objected to. Treatment at the Government Dispensary or Hospital is free.

Town-planning and Building Regulation should in time result in a healthier environment.

There is much reason to regard as well-founded the belief that Pulmonary Tuberculosis is steadily on the increase, whether actual figures can be quoted to prove it or not. A large number of the cases which come for treatment are already in a hopeless condition.

From Saltpond the Medical Officer reported 34 cases in a year and five months (not all in the town). These included five from the prison (one fatal, the other four discovered on post-mortem examination for other reasons); of the other 29 cases 23 were confirmed by the microscope.

The over-crowded state of some of the gaols has an obvious bearing on the question as it affects prisoners.

Increased prison accommodation in the Colony is on the programme of works for 1920, and special provision for consumptive convicts is in view.

In the Slaughter-house at Accra only one ox out of 1,984 slaughtered, and one goat out of 2,524 were found to be tuberculous.

Venereal Diseases.—The extent of these amongst the general population is not truly indicated by the hospital and dispensary returns. Female cases in particular are no doubt much under-estimated. Early treatment is inculcated, but venereal clinics in the large centres will probably prove to be the first step in a wide-reaching measure to secure early diagnosis, treatment, and prophylaxis, as well as to acquire more accurate information on which to base future action.

Helminthic Diseases.

Ankylostomiasis is reported to be common in the coastal regions where the soil is very sandy, *e.g.*, west of Axim, in the neighbourhood of Quittah, etc. The prevention depends on proper methods of disposal of excrement, and the adoption of the civilised habit of protecting feet and legs from contact with polluted soil.

Bilharzia and *Guinea-Worm* are both more common in persons coming from the north. The prevention of each depends on preserving the water-supply from pollution by infected persons.

Tapeworm is also more common amongst Hausa-speaking people whose habit it is to eat imperfectly cooked meat.

(iii.) General Measures.

Details as to housing, markets and slaughter-houses, disposal of excreta and refuse, drainage clearing, reclamation, oiling, inspections, prosecutions, &c., are shown in Table IV.

Regular routine inspection of premises and of out-door conditions liable to lead to nuisances or to favour multiplication of disease-carrying insects forms the general scheme of work of the subordinate sanitary officers. These inspections have been fairly well maintained during the year.

Owing to labour shortage the gaps in some of the mosquito-brigades have at times been filled by women and boys.

The Supplementary Estimates provided funds for additional labour at Koforidua and Appam, and for the purchase, at enhanced prices, of necessary materials for sewage and refuse disposal. Extra labour at Seccondee, and for clearing the Segregation Area at Winnebah, was provided by Special Warrant.

Much clearing on Segregation Areas has had to remain in abeyance, or to be limited to the maintenance of areas already cleared. The scarcity of rain was probably favourable in this respect. At Dunkwa and Nsawam considerable clearing was done.

Segregation.—The principle of segregation of Europeans, affording protection to most Government Officials and an increasing number of non-officials, is adhered to, as far as possible, and in the lay-out of new stations is a first consideration.

Several European firms have taken up sites for residence in the Segregation Areas. The area at Winnebah was extended to accommodate 2nd Class Officials and European Merchants.

Drainage and Reclamation.—At Axim some useful work was done in clearing and opening out the swamps, planting *dhub* grass, and improving the streams adjoining the Segregation Area.

Much use is made of town refuse in reclaiming hollows, either after incineration, or by depositing at suitable spots, where it is sorted and covered from time to time with sand or earth.

Not much extension of permanent drains could be accomplished during the year, but in Accra Township over 1,000 linear yards were constructed.

An extensive programme is in view for 1920.

Sewage Disposal.—To improve the condition of the foreshore at Korle Gono, where the night-soil from Accra is thrown into the surf, a tipping depôt, with flush tank and concrete sewer discharging to the sea, is in course of construction.

The extension of municipal boundaries in some large towns raises the problem of expediting the removal of night-soil and its disposal at greater distances. Motor carriage is in use at Accra and is in prospect for Coomassie. Possibly tramways with removal at night may be a feasible alternative in future for some stations, until water-carriage systems come into being.

Sanitary Improvements.—Acquisition of spaces and property in Accra was made with a view to certain town improvements.

In various other towns sanitary improvements in the addition of necessary public latrines, incinerators, dustbins, wash-houses, etc., were carried out.

Water Supplies.—The method of purification adopted for the Accra Water Supply is the Excess Lime process, and half-yearly reports on the results of its use have been furnished. During the first half year, samples from the Final Filters and from supply pipes in the town showed a bacteriological condition which was satisfactory on the whole, but certain fluctuations occurred, indicating the need for constant control by the Chemist, when applying the lime treatment to water of a varying quality according to the state of the river at the time of intake. The ability of the Excess Lime process to render the water epidemiologically safe was thus beyond doubt, but the need for expert attention to detail was evident.

During the second period the bacteriological results at the Final Filters were practically uniformly excellent, and if the expected additions to the European Staff are made, the control of the details of applying the lime, testing the raw water, and the lime under varying conditions, and the taking of samples for analysis will be more complete than has been possible hitherto. The action of the Filters appears to be completely satisfactory.

A committee was appointed and held its first meeting in October for the purpose of carrying out certain experiments in connection with the desired purification of the Seccondee Water Supply.

A sub-committee was formed consisting of the Maintenance Engineer of the Seccondee Water Works, the Inspector Chemist, and the Medical Officer of Health, Seccondee, to draw up a scheme and to report.

Experiments on the comparative effects of Excess Lime and of Alum Sulphate in purifying and decolorising the water, and on the sterilising effect of Chlorine, are now in progress. Arrangements for the bacteriological examination of samples locally, will shortly be available by the equipment of a laboratory at Seccondee.

The comparatively small rainfall during the year has accentuated the insufficiency of the water supply at Coomassie, Cape Coast, and Saltpond. Air-motors are being provided for Cape Coast, Saltpond and Winnebah.

Town-planning and *Building Regulation.* No important town-planning schemes came into operation during the year, but numerous insanitary single dwellings were demolished in various large towns.

A location for Railway employees is in preparation at Seccondee, and proposals for a new Segregation Area along with a comprehensive scheme for development of the whole township have been drawn up.

The lay-out of Mamfun (near Appam) was accomplished, and at Swedru, a town lay-out was started ; a Hausa quarter was laid out at Imbraim.

Shortage of housing accommodation is a sinister feature of most coast towns at present. Evacuation of dilapidated buildings, and prosecutions for overcrowding, are unjustifiable in the absence of reasonable accommodation elsewhere. Labourers in the large centres often have to spend a very considerable proportion of their monthly wages on a small room shared with others, or a few square feet of verandah.

The site and structure of any new building are submitted for approval by sanitary experts, and on completion of the work a certificate of fitness has to be obtained. Building permits are also required for alterations to existing buildings. Laxity resulting from shortage of European Staff during the war has become evident, buildings being erected without or contrary to permit, but the appointment of qualified European Building Inspectors will prevent this in future. These are more necessary now, than ever before, for town-planning and improvement schemes, and for supervision of compliance with site and building permits not only in the larger towns but also in the growing settlements of the prosperous cocoa districts, and in the towns along the lines of railway.

In Accra, 224 Building Permits were issued and 42 notices served on owners of buildings erected without a permit—14 were pulled down ; 49 notices in respect of insanitary dwellings were served and 14 buildings were demolished.

Inspections and *Prosecutions.*—The total number of house inspections made was 360,825, and mosquito larvæ were found in 2,529 cases.

Prosecutions for offences under the Towns and Public Health Ordinance and under the Mosquito Destruction Ordinance numbered 8,448, of which 8,337 resulted in convictions ; the fines amounted to £3,066 14s. 6d.

B.—MEASURES TO SPREAD THE KNOWLEDGE OF HYGIENE AND SANITATION.

The presence and work of Sanitary Inspectors have themselves some educative effect. They are carefully instructed by lectures and demonstrations as well as undergoing a period of practical training at headquarters, before being sent out to their districts. When opportunity occurs, or special occasion arises for the need of definite information and guidance, this is given by circulars, leaflets, etc., and the native chiefs are instructed.

Elementary Sanitation is also one of the subjects of instruction of Probationer Nurses and Dispenser Pupils.

In Government and Assisted Schools the teaching of Hygiene is compulsory from Standard IV. upwards, and it is satisfactory to know that the instruction is not confined to book-teaching but is amplified by experiments arranged for the scholars and carried out by themselves.

" Knowledge comes but wisdom lingers ", and although a knowledge of the main facts as to insect-borne diseases, and an understanding of the reasons underlying the importance of elementary cleanliness can be conveyed through instruction in schools, and indirectly through the routine of sanitary work, it may take generations to alter appreciably the attitude and opinion of the people in general, a conversion which is essential to progress.

The Director of Education reports as follows :—

" Formal instruction in Hygiene begins in Standard IV. (*i.e.* about half-way through " the school career). Instruction, however, really begins immediately a child enters " a school, in so much that the child is taught personal cleanliness, to refrain from spitting, " to keep the school and its surroundings clean, etc., etc.

" Text books are not in *general* use in the schools, but if a book is used Strachan's " is recommended. The use of a text book by pupils in primary schools has not been " encouraged, as it is often found to result in the instruction being too mechanical and " theoretical, instead of practical.

" Students in the Accra Training College for Teachers and in the Scottish Mission " Seminary at Akropong, receive instruction in Hygiene during the two years that they " are in residence. At the Training College, the instruction is generally given by the " European Masters. During the first year the syllabus of work taken in the primary " school forms the basis of instruction. In the second year the work is of a more advanced " description and Dr. Prout's ' Lessons on Elementary Hygiene ' is used."

C.—RECOMMENDATIONS FOR FUTURE WORK.

a. Increase of European Staff.

b. Increase in the number of native Sanitary Inspectors, with a very considerable increase in the number of labourers. is required to meet the conditions arising in towns and districts which are rapidly developing with the stimulus to trade and agriculture following the conclusion of peace.

c. Several more Vaccinators are necessary in order to make possible a wider distribution, to allow of supply to districts threatened with an outbreak of Small-pox, and to carry out the provisions of the new Vaccination Ordinance wherever it is applied, and thus afford no ground for complaint that facilities for compliance are lacking.

d. Provision of motor transport to enable sanitary work to be supervised and carried out more thoroughly, and neighbouring districts to be visited more frequently by Medical Officers of Health, or by Medical Officers undertaking supervision of sanitary work in stations where there is no Medical Officer of Health.

e. Pipe-borne water supplies for Coomassie, Cape Coast, Saltpond, Winnebah, Koforidua, and Axim, with adequate drainage.

f. Engineering treatment of the Accra Lagoon, and reclamation of the valley.

g. An improved method of sewage disposal for Seccondee.

h. Special study directed towards the subject of Tuberculosis, the chief sources and conditions of infection, and possible measures of prevention and treatment.

i. Anti-venereal cliniques.

j. Initiation of a scheme for health-visiting and infant welfare.

k. Provision of waiting-rooms for medical inspection of immigrant labourers and of passengers landing from infected ports.

J. M. DALZIEL,

Senior Sanitary Officer.

ACCRA,

12th February, 1920.

IV.—METEOROLOGY.

17. The rainfall during the year was well below the mean of the previous three years : –

RAINFALL IN INCHES.

Station.	1916.	1917.	1918.	1919.
Accra	41·05	44·20	32·37	20·44
Aburi	48·66	73·16	42·24	34·54
Cape Coast	53·62	56·25	35·30	29·19
Seccondee	37·67	56·76	34·53	38·25
Axim	110·45	94·50	47·64	56·05
Tarquah	77·08	92·62	53·80	59·36
Coomassie	60·79	71·40	58·64	37·08
Tamale	45·52	35·76	44·45	38·61

V.—HOSPITALS AND DISPENSARIES.

18. Total cases treated at the various Government Hospitals and Dispensaries during the year 1919 was 58,305.

The following table shews the total number of In-patients treated at Accra, Seccondee and Coomassie Hospitals :—

Station.	1917.		1918.		1919.	
	Europeans.	Natives.	Europeans.	Natives.	Europeans.	Natives.
Accra	188	1,022	140	871	166	594
Seccondee	152	464	186	380	184	317
Coomassie	87	1,142	143	2,287	100	1,305
Totals ..	427	2,628	469	3,538	450	2,216

19. During the year plans were drawn up for a new Native Hospital at Accra which, when completed, will be a very great advance on the existing one, and will afford considerably more advantages than are at present available. It is to be commenced in 1920.

PRISONS.

20. The general health of the prisoners was satisfactory. The death-rate which in 1918 was 11·2 per 1,000 owing to the outbreak of influenza in that year, fell to 5·51 in 1919.

	1917.	1918.	1919.
Total convicts	6,525	6,694	8,166
Total sick	990	1,391	2,211
Total deaths	27	85	45

VI.—SCIENTIFIC.

21. A large amount of very valuable work has been done and the possibilities in the future are very great. With the increase of patients the amount of work in connection with them, which is referred to the Pathologist, is rapidly becoming greater and forms a considerable portion of the work done in the Laboratory.

The report of the Pathologist is attached as an appendix.

ARTHUR PICKELS,

Principal Medical Officer.

29th April, 1920.

TABLE IV.

1.—Name of Town.

Station.	1918.		1919.	
	Approximate Area.	No. of pro-claimed open spaces	Approximate Area.	No. of pro-claimed open spaces.
Accra	4½ sq. miles	26	4½ sq. miles	26
Cape Coast	2½ sq. miles	4	2½ sq. miles	4
Seccondee	3 sq. miles	3	3 sq. miles	3
Coomassie	9 sq. miles	—	9 sq. miles	—

2.—Population.

Station.	1918.					1919.				
	Native.		Europeans.		Total.	Native.		Europeans.		Total.
	Males.	Females.	Males.	Fe-males.		Males.	Females.	Males.	Fe-males.	
Accra ..	13,000	10,250	180	20	23,450	13,346	10,485	304	70	24,205
Cape Coast	5,010	5,502	37	7	10,556	4,951	5,419	39	12	10,421
Seccondee ..	6,279	6,744	140	6	13,169	7,712	4,288	126	18	12,144
Coomassie	13,000	17,020	132	3	30,185	14,028	17,814	140	14	31,996

3.—Housing.

Station.	1918.				1919.			
	Houses.		Huts.		Houses.		Huts.	
	Europeans.	Native.	Europeans.	Natives.	Europeans.	Natives.	Europeans.	Natives.
Accra	145	2,901	See	Houses	150	2,969	See	Houses
Cape Coast ..	22	1,320	—	321	24	1,362	—	319
Seccondee ..	132	1,230	—	—	137	1,442	—	—
Coomassie ..	46	2,754	—	762	48	2,444	—	123

TABLE IV.—*continued.*

4.—MOSQUITO PROTECTION OF HOUSES.

Station.	1918.				1919.			
	Number of houses wholly protected.	Number of houses with Mosquito-proof room.	Made wholly protected in 1918.	Partially protected in 1918.	Number of houses wholly protected.	Number of houses with Mosquito-proof room.	Made wholly protected in 1919.	Partially protected in 1919.
Accra	—	20	—	—	—	20	—	—
Cape Coast ..	—	4	—	—	—	2	—	—
Seccondee ..	—	22	—	—	2	22	2	—
Coomassie ..	—	16	—	2	—	12	—	2

5 (A).—ERECTION OF NEW BUILDINGS DURING THE YEAR.

Station.	1918.					1919.				
	Public Buildings with full sanction.	Houses with full sanction.	Huts with full sanction.	Houses without sanction	Huts without sanction.	Public Buildings with full sanction.	Houses with full sanction.	Huts with full sanction.	Houses without sanction.	Huts without sanction.
Accra ..	—	151	—	15	40	—	224	—	42	—
Cape Coast..	—	—	—	—	—	1	11	—	1	—
Seccondee ..	—	28	—	—	—	—	12	—	—	—
Coomassie ..	4	33	—	—	—	—	103	—	—	—

5 (B).—ACTION TAKEN.

Station.	1918.				1919.			
	Number of prosecutions.		Number demolished.		Number of prosecutions.		Number Demolished	
	Huts.	Houses.	Huts.	Houses.	Huts.	Houses.	Huts.	Houses.
Accra	—	—	94	—	—	—	— 14	—
Cape Coast ..	—	2	—	1	—	1	3	4
Seccondee ..	—	—	12	—	—	—	12	—
Coomassie ..	—	—	1	1	—	—	—	—

TABLE IV.—*continued.*

6.—MARKETS.

Station.	1918.			1919.		
	Number.	Paved and drained.	Unpaved.	Number.	Paved and drained.	Unpaved.
Accra	2	2	—	3	2	1
Cape Coast	2	2	2	2	2 (one partly paved)	—
Seccondee	4	3	1	2	2	—
Coomassie	3	1	2	3	1	2 (one partly)

7.—SLAUGHTER HOUSES.

Station.	1918.			1919.		
	Number.	Paved and drained.	Unpaved.	Number.	Paved and drained.	Unpaved.
Accra	1	1	—	1	1	—
Cape Coast	1	1	—	1	1	—
Seccondee	2	2	—	2	2	—
Coomassie	2	2	—	2	2	—

TABLE IV.—*continued.*

8.—LATRINES.

Station	1918.																1919.											
	Number.				New Ones				Repaired.				Demolished.				Number.				New Ones.				Repaired.			
	Male.		Female.		Male.		Female.		Male.		Female.		Male.		Female.		Male.		Female.		Male.		Female.		Male.		Female.	
	Number.	Seats.	Number.	Seats.	Number.	Seats.	Number.	Seats.	Number.	Seats.	Number.	Seats.	Number.	Seats.	Number.	Seats.	Number.	Seats.	Number.	Seats.	Number.	Seats.	Number.	Seats.	Number.	Seats.	Number.	Seats.
Accra	40	473	40	250	—	—	—	—	—	—	—	—	—	—	—	—	38	449	38	226	—	—	—	—	—	—	—	—
Cape Coast ..	11	144	9	144	1	6	1	6	—	—	—	—	1	6	1	6	18	172	17	164	—	—	—	—	13	146	12	122
Seccondee ..	11	196	11	196	2	12	2	12	—	—	—	—	—	—	—	—	11	196	11	196	—	—	—	—	—	—	—	—
Coomassie ..	30	262	28	257	—	—	—	—	—	—	—	—	—	—	—	—	25	179	25	181	—	—	—	—	1	—	—	—

Station.	1918.								1919.							
	Number.	Pails removed daily.	No. of clean pails substituted for dirty ones.	No. of night-soil men.	Cesspools.	Cesspools cleansed.	New cesspools.	Cesspools abolished.	Cesspools regularly oiled.	Number.	Pails removed daily.	No. of clean pails substituted for dirty ones.	No. of night-soil men.	Cesspools.	Cesspools cleansed.	New Cesspools.	Cesspools abolished.	Cesspools regularly oiled.
Accra	280	602	38	54	—	—	—	—	—	338	610	—	54	—	—	—	—	—
Cape Coast	89	817	3	29	10	—	2	2	—	80	773	773	28	10	—	4	6	—
Seccondee	207	199	199	31	—	—	—	—	—	237	199	199	44	—	—	—	—	—
Coomassie	173	391	391	64	—	—	—	—	—	137	466	64	—	—	—	—	—	—

TABLE IV.

9.—Removal of Refuse.

Station.	1918.						1919.					
	Dustbins.	Carts removing street refuse.	Amount of refuse removed daily from streets.	Carts removing refuse from yards and premises.	Amount of refuse from yards and premises.	Men employed.	Dustbins.	Carts. removing street refuse.	Amount of refuse removed daily from streets.	Carts removing refuse from yards and premises.	Amount of refuse from yards and premises.	Men employed.
Accra	41	12	95	4	12	40	35	13	74	4	12	40
Cape Coast	39	10	67 cart-loads	1	1 cart-load	31	39	10	62½ cart-loads	—	1 cart-load	31
Seccondee	19	2 lorries	23 cart-loads	—	—	31	18	2 lorries	25 cart-loads	—	—	26
Coomassie	—	1 cart & 51 bkts.	163 head-loads.	2	0 9 head-loads.	25	—	—	559 head-loads.	1	188 head-loads.	24

10.—Mode of Disposal of Excreta, Refuse and Offal.

Station.	1918.												1919.											
	Buried or trenched.			Burnt.			Thrown into sea.			Otherwise dealt with.			Buried or trenched.			Burnt.			Thrown into sea.			Otherwise dealt with.		
	Pails excreta per day.	Cart-loads refuse per day.	Cart-loads Offal per day.	Pails excreta per day.	Cart-loads refuse per day.	Cart-loads offal per day.	Pails excreta per day.	Cart-loads refuse per day.	Cart-loads offal per day.	Pails excreta per day.	Cart-loads refuse per day.	Cart-loads offal per day.	Pails excreta per day.	Cart-loads refuse per day.	Cart-loads offal per day.	Pails excreta per day.	Cart-loads refuse per day.	Cart-loads offal per day.	Pails excreta per day.	Cart-loads refuse per day.	Cart-loads offal per day.	Pails excreta per day.	Cart-loads refuse per day.	Cart-loads offal per day.
Accra	—	44	—	—	—	—	602	—	6½	—	95	—	—	44	—	—	—	—	610	—	7	—	86	—
Cape Coast	—	1	1/5 h.ld.	66	66	—	817	—	—	—	—	—	—	1	1/15 h.ld.	—	61½	—	730	—	1/7	—	—	—
Seccondee	—	—	—	—	—	—	199	—	2 h.lds.	—	23	—	199	—	1½ h.lds.	—	—	—	—	—	½ h.ld.	—	25	—
Coomassie	391	—	40 h.lds.	—	272 h.lds.	—	—	—	—	—	—	—	446	20.4	8.27	—	—	—	—	—	—	—	—	—

TABLE IV.—*continued.*

11.—Average Daily Number of Cartloads of Cans, Bottles and Incombustible Material Removed from Houses and Compounds.

Station.	1918.	1919.
Accra	44	40
Cape Coast	1	1
Seccondee	2	2
Coomassie	83 head-loads ..	66.27 head-loads

12.—Water Supply.

Station.	Pipe-Borne Water				Wells.				Tanks.														Barrels.	
					Public.		Private.		Public.						Private.						Native.			
	Source.	Lineal yards.	Public stand-pipes.	Private stand-pipes.	No.	M.P., etc.	No.	M.P., etc.	Under-ground.	M.P., etc. pump.	Above ground.	M.P.	400 gallons or less.	Above 400 gallons.	Under ground.	M.P., etc. pump.	Above ground.	M.P., etc.	400 gallons or less.	Above 400 gallons.	Wood.	Iron.	Concrete.	No.	M.P.
Accra	River Densu	42,174	46	290	—	—	115	115	6	6	63	63	24	49	32	32	45	45	25	31	4	27	21	105	105
Cape Coast	—	—	—	—	9	5	243	240	13	13	14	14	—	27	62	60	133	132	50	145	10	119	66	595	585
Seccondee	Ana-kwan River	23,976	28	45	8	8	135	128	—	—	81	81	—	81	43	41	301	296	76	225	5	227	112	238	234
Coomassie	—	—	—	—	16	6	105	81	—	—	—	—	—	—	1	1	3	3	34	—	2	29	3	175	135

TABLE IV.—*continued.*

13.—Drainage (Public).

Station.	Masonry Drains.								Earth Drains.					
	1918.				1919.				1918.			1919.		
	Lineal yards.	Lineal yards reconstructed.	Lineal yards repaired.	Lineal yards constructed.	Lineal yards.	Lineal yards reconstructed.	Lineal yards repaired.	Lineal yards constructed.	Lineal yards cleaned.	Lineal yards dug.	Frequency of cleaning.	Lineal yards cleaned.	Lineal yards dug.	Frequency of cleaning.
Accra	35,480	—	—	—	35,480	—	—	970	40,735	485	Every 2 months.	45,418	7,130	Every 2 months.
Cape Coast	18,913	835	—	—	19,900	—	229	152	—	—	Continuously.	20,360	—	Continuously.
Seccondee	20,000	356	250	125	20,152	—	—	30	3,282	1,328	Twice a quarter.	3,282	—	Twice a quarter.
Coomassie	7,847	—	—	77	8,313	—	—	4,616	19,070	1,500	4 times monthly.	14,900	1,230	6 times a month.

14.—Clearance of Undergrowth, Grass, Weeds, &c.

Station.	1918.		1919.	
	Square yards grass, etc., cut and removed.	Frequency of clearance.	Square yards grass, etc., cut and removed.	Frequency of clearance.
Accra	4,541,527	Four times a year.	3,555,400	Every quarter.
Cape Coast	196,756	Continuously.	436,528	Continuously.
Seccondee	588,626	Quarterly.	248,599	Quarterly.
Coomassie	2,437,310	Every six weeks.	4,679,505	Every six weeks.

TABLE IV.—*continued.*

15.—Excavations and Low-lying Land.

Station.	1918.							1919.						
	Pools and excavations.	Excavations filled up.	Amount of marsh raised and drained.	Pools, streams, etc., fish stocked.	Cubic yards material used for filling in.	Persons fined for making excavations.	Men employed daily for filling in.	Pools and excavations.	Excavations filled up.	Amount of marsh raised and drained.	Pools, streams, etc., fish stocked.	Cubic yards material used for filling in.	Persons fined for making excavations.	Men employed daily for filling in.
Accra	5	5	—	—	740	—	7	5	2	6 acres.	—	?	—	6
Cape Coast	—	—	3,038 cu. yards	—	Many cart-loads.	—	4	16	13	4,790 sq. yards	—	50,901	1	2
Seccondee	120	120	19,560 sq. yards	—	40,438	—	—	80	40	25,000 sq. yards	—	45,000	—	—
Coomassie	—	27	112 sq. yards.	4	Not estimated.	—	25	—	—	80 sq. yards.	—	Not estimated.	—	—

16.—Oiling.

Station.	1918.				1919.			
	Drains oiled.	Pools and excavations oiled.	Tanks and barrels oiled.	Men employed daily for oiling.	Drains oiled.	Pools and excavations oiled.	Tanks and barrels oiled.	Men employed daily for oiling.
Accra ..	7,276	17,032	1,568	3	3,592	3,892	726	3
Cape Coast ..	270	245	740	4	107	319	512	4
Seccondee ..	155	120	72	5	160	101	72	5
Coomassie ..	2,269	2,146	—	4	371	1,230	—	4

TABLE IV.

17.—Inspections and Prosecutions.

Station.	1918.								1919.							
	Inspectors Employed.	Houses Inspected.	Houses Where Larvæ were found.	Notices against Larvæ.	Persons fined for Larvæ.	Notices *re* Insanitary Conditions.	Persons fined for Insanitary Conditions.	No. of Soda and Aerated Factories Inspected.	Inspectors Employed.	Houses Inspected.	Houses where Larvæ were found.	Notices against Larvæ.	Persons fined for Larvæ.	Notices *re* Insanitary Conditions.	Persons fined for Insanitary Conditions.	No. of Soda and Aerated Factories Inspected.
Accra	14	94,625	672	331	480	755	—	—	12	113,335	904	288	738	864	21	—
Cape Coast	12	28,675	533	242	359	37	21	—	12	27,188	296	553	233	191	48	—
Seccondee	9	61,098	561	722	440	343	106	—	8	49,351	190	250	126	280	134	—
Coomassie	4	25,100	282	62	212	180	1,696	1	5	19,882	391	60	391	473	906	1

TABLE V.

Return of Diseases and Deaths (in and Out-Patients) for the Year 1919.

Diseases.	Remaining in Hospital at end of 1918.	Yearly Total. New Cases.	Yearly Total. Deaths.	Total Cases treated.	Remaining in Hospital at end of 1919.	Remarks.
Infective Diseases.						
Beri-Beri	—	8	3	8	1	
Cerebro-Spinal Fever	—	2	—	2	—	
Chicken-Pox	5	116	—	121	8	
Cholera	—	—	—	—		
Dengue	—	—	—	—	—	
Diphtheria	—	—	—	—	—	
Dysentery (Amœbic)	1	17	—	18	—	
Dysentery (Bacillary)	1	6	2	7	—	
Dysentery (Unallocated)	1	432	10	433	1	
Endocarditis—infective	—	—	—	—	—	
Enteric	—	9	—	9	1	
Erysipelas	—	15	—	15	—	
Gonorrhœa	4	1,328	—	*1,332	1	
Influenza	8	127	4	135	1	
Kala Azar	—	1	—	1	—	
Leprosy (*a* Nodular	3	15	—	18	2	
(*b*) Anæsthetic	—	4	—	4	—	
Malaria (*a*) Tertian	—	645	—	645	2	
(*b*) Quartan	—	42	—	42	1	
(*c*) Aestivo-autumnal	6	454	3	460	1	
(*d*) Chronic Malaria	—	145	2	145	—	
(*e*) Black-water	1	10	3	11	—	
(*f*) unallocated	1	2,445	2	2,446	5	
Measles	—	14	—	14	—	
Malta Fever	—	—	—	—	—	
Plague	—	—	—	—	—	
Pneumonia	1	276	26	277	2	
Rabies	—	—	—	—	—	
Relapsing Fever	—	—	—	—	—	
Rheumatic Fever	—	11	3	11	1	
Septicæmia	—	9	4	9	—	
Trypanosomiasis (Sleeping Sickness)	—	14	3	14	—	
Small-Pox	—	23	9	23	—	
Syphilis (*a*) Primary	1	170	—	171	2	
(*b*) Secondary	2	158	4	160	3	
(*c*) Inherited	—	37	—	37	—	
Tetanus	—	19	6	19	—	
Tuberculosis	—	269	24	269		
Whooping Cough	—	72	—	72	—	
Yaws	—	477	—	477	1	
Yellow Fever	1	8	1	9	—	One case yellow Fever at Lome not included in the Return—resulted fatally.
Pyrexia of unknown origin	6	387	—	393	1	
Pappataci Fever	—	5	—	5	—	
Thermic Fever	—	1	1	1	—	
Other Diseases	—	252	—	252	—	
Intoxications.						
Alcoholism	—	25	1	25	—	
Morphinism	—	1	—	1	—	
Others	—	3	—	3	—	
Anæmia	2	152	1	154	1	
Anæmia—Pernicious	—	6	2	6	—	
Diabetes	—	2	—	2	—	
Goitre	—	5	—	5	—	
Gout	—	4	—	4	—	
Leucocythæmia	—	2	1	2	—	
Hodgkin's Disease	—	—	—	—	—	
Myxædema	—	—	—	—	—	
Purpura	—	—	—	—	—	
Rickets	—	2	—	2	—	
Scurvy	—	15	—	15	—	
Chronic Rheumatism	1	2,057	—	2,058	—	
Debility	—	234	4	234	—	
Other Diseases	4	264	3	268	3	

Diseases.	Remaining in Hospital at end of 1918.	Yearly Total.		Total Cases treated.	Rema n in Hospital at end of 1919.	Remarks.
		New Cases.	Deaths.			
LOCAL DISEASES.						
Diseases of the Nervous System :—						
Sub-section 1.						
Neuritis	—	45	1	45	—	
Meningitis ..	—	29	12	29	—	
Myelitis	—	1	—	1	—	
Hydrocephalus	—	2	—	2	—	
Encephalitis Lethargica	—	2	1	2	—	
Abscess of Brain	—	1	—	1	—	
Congestion of Brain	—	2	—	2	—	
Other Diseases	—	13	—	13	1	
Sub-section 2.						
Apoplexy	—	12	5	12	2	
Paralysis	1	29	1	30	—	
Chorea	—	3	—	3	—	
Epilepsy	—	47	2	47	—	
Neuralgia	—	222	—	222	—	
Hysteria	—	52	—	52	1	
Other Diseases	—	270	2	270	3	
Sub-section 3.						
Mental Diseases —						
Idiocy	—	2	—	2	1	
Mania	1	14	1	15	1	
Melancholia	—	2	—	2	—	
Dementia	—	3	—	3	—	
Delusional Insanity	—	5	—	5	—	
Other Diseases	—	5	—	5	—	
Diseases of the Eye :—						
Conjunctivitis	—	1,980	—	1,980	3	
Keratitis	—	54	—	54	—	
Ulceration of Cornea	—	47	—	47	1	
Iritis	—	73	—	73	—	
Optic Neuritis	—	1	—	1	—	
Cataract	—	106	—	106	2	
Other Diseases	1	222	2	223	2	
Diseases of the Ear :—						
Inflammation	—	373	—	373	—	
Other Diseases	—	758	—	758	—	
Diseases of the Nose	—	172	—	172	—	
Diseases of the Circulatory System:						
Pericarditis	—	33	3	33	—	
Endocarditis	—	2	—	2	—	
Valvular Mitral	—	82	11	82	—	
,, Aortic	—	15	—	15	—	
,, Tricuspid	—	—	—	—	—	
.. Pulmonary	—	—	—	—	—	
Arterial Sclerosis	—	4	—	4	—	
Aneurism	—	20	2	20	—	
Other Diseases	—	143	4	143	1	
Diseases of the Respiratory System—						
Laryngitis	—	67	—	67	1	
Bronchitis	5	4,581	10	4,586	3	
Broncho-pneumonia	1	105	2	106	—	
Abscess of Lung	—	—	—	—	—	
Gangrene of Lung..	—	—	—	—	—	
Emphysema	—	9	—	9	—	
Pleurisy	5	226	4	231	5	
Empyema	—	—	—	—	—	
Other Diseases	—	314	1	314	—	
Diseases of the Digestive System :—						
Stomatitis	—	232	—	232	—	
Caries of teeth	—	939	—	939	—	
Glossitis	—	16	—	16	—	
Sore Throat	1	142		143	1	
Inflammation of Tonsils	—	357	—	357	—	

Diseases.	Remaining in Hospital at end of 1918,	Yearly Total.		Total Cases treated.	Remaining in Hospital at end of 1919.	Remarks.
		New. Cases.	Deaths.			
LOCAL DISEASES—(*continued*).						
Gastritis	—	365	1	365	—	
Ulceration of Stomach	—	—	—	—	—	
Hæmatemesis	—	6	—	6	—	
Dilatation of Stomach	—	—	—	—	—	
Stricture of Stomach	—	—	—	—	—	
Dyspepsia	1	735	—	736	—	
Enteritis	—	235	6	235	1	
Appendicitis	—	6	—	6	—	
Colitis	—	59	—	59	—	
Ulceration of Intestines	—	2	—	2	—	
Sprue	—	—	—	—	—	
Hernia	—	195	1	195	6	
Diarrhœa	2	1,201	4	1,203	1	
Constipation	—	4,717	—	4,717	—	
Colic	—	388	—	388	—	
Hœmorrhoids	—	197	—	197	1	
Pancreatitis	—	—	—	—	—	
Hepatitis	—	145	—	145	—	
Liver Abscess	—	15	2	15	—	One case of Liver Abscess and Septic Nephritis at Lome not included in the Return resulted fatally.
Cirrhosis	1	9	5	10	—	
Jaundice	—	31	—	31	—	
Peritonitis	—	11	6	11	1	
Ascites	—	17	1	17	2	
Other Diseases	4	254	3	258	3	
Diseases of the Lymphatic System—						
Splenitis	—	90	—	90	—	
Inflammation of Lymphatic Gland	—	340	—	340	1	
Suppuration of Lymphatic Gland	1	94	—	95	—	
Lymphangitis	—	38	1	38	—	
Elephantiasis	—	30	—	30	—	
Other Diseases	—	219	—	219	—	
Diseases of the Urinary System :—						
Acute Nephritis	1	90	7	91	—	
Bright's Disease	—	19	—	19	2	
Pyelitis	1	1	—	2	—	
Calculus	—	10	—	10	1	
Renal Colic	—	17	1	17	—	
Cystitis	1	104	—	105	1	
Vesical Calculus	—	—	—	—	—	
Suppression	—	—	—	—	—	
Hæmaturia	—	30	—	30	1	
Chyluria	—	—	—	—	—	
Other Diseases	—	24	—	24	—	
Diseases of the Generative System—						
Male Organs :—						
Urethritis	—	67	—	67	—	
Gleet	—	28	—	28	—	
Stricture	—	117	—	117	—	
Prostatitis	—	9	—	9	—	
Soft chancre	4	252	—	252	1	
Condyloma	—	—	—	—	—	
Inflammation of Scrotum	1	10	—	11	—	
Hydrocele	—	66	—	66	—	
Orchitis	—	178	—	178	1	
Epedidymitis	—	22	—	22	—	
Abscess of Testicle	—	9	—	9	1	
Other Diseases	3	277	3	280	6	
Female Organs :—						
Ovaritis	—	20	—	20	—	
Ovarian Cyst	—	—	—	—	—	
Endometritis	—	93	—	93	1	
Displacement of Uterus	—	18	—	18	—	
Vaginitis	1	36	—	37	—	
Amenorrhœa	—	80	—	80	—	
Dysmenorrhœa	—	138	—	138	—	
Menorrhagia	—	44	—	44	—	
Leucorrhœa	—	25	—	25	—	

Diseases.	Remaining in Hospital at end of 1918.	Yearly Total. New Cases.	Yearly Total. Deaths.	Total Cases Treated.	Remaining in Hospital at end of 1919.	Remarks.
LOCAL DISEASES—(*continued*).						
Abortion	—	35	1	35	1	
Delayed Labour	—	20	5	20	—	
Postpartem Hæmorrhage	—	—	—	—	—	
Retained Placenta	—	5	—	5	—	
Premature Birth	—	—	—	—	—	
Puerperal Septicæmia	—	2	—	2	—	
Mastitis	1	58	—	59	1	
Abscess of Breast	—	7	—	7	—	
Other Diseases	1	109	2	110	4	
Diseases of Organs of Locomotion :—						
Osteitis	—	101	—	101	4	
Arthritis	1	146	—	147	1	
Spondylitis	—	—	—	—	—	
Bursitis	—	73	—	73	1	
Other Diseases	4	1,818	1	1,822	2	
Diseases of Connective Tissue :—						
Cellulitis	1	544	1	545	5	
Abscess	4	793	2	797	6	
Elephantiasis	—	9	—	9	—	
Other Diseases	—	266	1	266	—	
Diseases of the Skin :—						
Urticaria	—	73	—	73	—	
Eczema	1	412	—	413	—	
Boil	—	560	—	560	—	
Carbuncle	—	6	—	6	—	
Herpes	1	59	—	60	—	
Psoriasis	—	20	—	20	—	
Oriental Sore	—	26	—	26	—	
Tinea	—	534	—	534	—	
Scabies	—	607	—	607	—	
Acne	—	37	—	37	—	
Prickly Heat	—	204	—	204	—	
Ulcers	30	5,301	4	5,331	22	
Ulcers, Tropical	—	1	1	1	—	
Other Diseases	—	902	—	902	3	
Injuries—General	1	247	13	248	3	
„ Local	38	7,934	32	7,972	35	
Surgical Operations :—						
Major	—	276	—	276	—	Not included in totals.
Minor	—	815	—	815	—	
Tumours	—	181	5	181	6	
Malformations	—	5	—	5	—	
Poisons	—	51	—	51	—	
Parasitis—Animal	—	—	—	—	—	
Protozoa	—	2	1	2	—	
Trematoda (Flukes)	—	—	—	—	—	
Bilharzia	—	45	—	45	1	
Other Diseases	—	2	—	2	—	
Cestoda :—						
Tœnia Solium	—	462	—	462	—	
Tœnia Saginata	—	583	—	583	—	
Nematoda :—						
Asearis	—	371	—	371	—	
Trieocephalus Dispar	—	1	—	1	—	
Trichina	—	2	—	2	—	
Dracunculus	5	887	2	892	7	
Filariasis	—	7	—	7	—	
Strongylus	—	10	—	10	—	
Ankylostomiasis	—	148	6	148	—	
Oxyuris	—	14	—	14	—	
Other Diseases	—	3	—	3	—	
Insecta :—						
Myiasis	—	17	—	17	—	
Chiggers	1	68	—	69	—	
Other Diseases	—	551	—	551	—	
Total	174	58,131	304	58,305	200	

APPENDIX A.

REPORT ON THE ROUTINE WORK OF THE LABORATORY AT ACCRA FOR THE YEAR 1919.

The laboratory was open throughout the year. Dr. A. Ingram was in charge from beginning of the year until the 14th of May when he was relieved by Dr. J. W. S. Macfie. On the 21st of November Dr. Ingram returned from leave and was again attached to the laboratory. Dr. M. W. Fraser also worked in the laboratory when his other duties permitted.

The Laboratory Assistant, Mr. P. C. Paittoo, Junr., has done good work throughout the year.

The facilities of the laboratory have been at the disposal of all Medical Officers in the Colony for pathological examinations of any sort, and have been made use of by them to a considerable extent. The greater part of the routine work done in the laboratory during the year has been, however, the examination of clinical materials submitted by the Medical Officers at Accra, the examinations of mosquito larvæ, rats, and water samples for the Sanitary Authorities, and post-mortem examinations. Records of research work are not included in this Report.

Laboratory Buildings, etc.

No improvements or additions have been made during the year; indeed, from lack of common repairs, the laboratory and its out-buildings are rapidly deteriorating. No accommodation has been provided for the Pathologists at the laboratory.

It is a serious defect of the laboratory organisation that no opportunity is afforded of investigating human diseases.

Examinations of Clinical Materials.

The following examinations have been made of clinical materials submitted by Medical Officers (see Table I.).

TABLE I.

Examinations.	Europeans.	Natives.	Totals.
Blood	195	235	430
Faeces	65	162	227
Urine	24	95	119
Sputum	12	36	48
Miscellaneous	63	78	141
Totals ..	359	606	965

A few pathological specimens from the Accra slaughter house have also been examined, and a few tests carried out on exhibits in medico-legal cases.

In connexion with a short investigation of malaria in native children 1,602 blood films were examined.

Examinations of Mosquito Larvæ.

Eight hundred and one samples containing mosquito larvae submitted for identification by the Sanitary Authorities, and thirty-three samples procured by the laboratory staff, were examined (see Table II.).

TABLE II.

Month.	Samples received from the Sanitary Department.	Samples received from other sources.
January	65	1
February	53	2
March	79	1
April	78	1
May	106	6
June	88	4
July	58	5
August	27	—
September	41	1
October	82	2
November	62	—
December	62	10
Totals ..	801	33

The species of mosquitoes found in these samples are shown in the following Table (see Table III.).

TABLE III.

Samples from the Sanitary Department.			Samples from other sources.		
Species of mosquito.	Found in samples.	Per-centage.	Species of mosquito.	Found in samples.	Per-centage.
Stegomyia fasciata, F. ..	726	90.6	*Stegomyia fasciata*, F.	15	
Culex fatigans, Wied ..	88	11.0	*S. cuteocephala*, Newst	6	
Culex decens, Theo. ..	10	1.2	*S. unilineata*, Newst	6	
Anopheles costalis, Loew.	8	1.0	*Culex Malassius*, Theo.	4	
Culex Malassius, Theo. ..	5	.6	*Anopheles costalis*, Loew.	4	
Culex tigripes var. *fuscus*, Theo...	3	.4	*C. decens*, Theo. ..	3	
			C. fatigans, Wied ..	2	
			S. metallica, Edw. ..	2	
			Culiciomyia nebulosa, Theo.	2	
			Ochlerotatus apico-annulatus, Edw. ..	2	
			O. albocephalus, Theo.	1	
			C. tigripes var. *fuscus* Theo.	1	
			C. tritæniorhynchus, Giles.	1	

It will be noted that larvæ of *Stegomyia fasciata* (*Aedes argenteus*) were found in 90·6 per cent. of the Sanitary samples. Several of the samples contained more than one species of larvæ.

Examinations of Rats.

One hundred and eighty-five rats received from the Sanitary Authorities were examined (see Table IV.).

TABLE IV.

Species.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Mus rattus	10	1	3	1	1	2	4	2	3	3	8	11	49
Mus decumanus	5	2	2	—	—	—	—	—	—	1	4	1	15
Cricetomys gambianus ..	22	12	16	5	9	10	10	1	7	8	11	9	120
Other species	—	—	—	—	—	—	1	—	—	—	—	—	1
Totals ..	37	15	21	6	10	12	15	3	10	12	23	21	185

It will be noted that the pouched rat, *Cricetomys gambianus*, was the species most frequently received for examination, and that the number of *W. rattus* was about three times as great as hat of *W. decumanus*.

Examinations of Samples of Water.

Eighty-eight samples of water were submitted for bacteriological examination. The majority of the samples were from Accra, and as they will be considered in the reports of other departments no details of the results obtained need be given here.

Post-mortem Examinations.

Fifty-two post-mortem examinations were made during the year. The causes of death were as follows (see Table V.).

TABLE V.

Cause of death.	Number of cases.		Cause of death.	Number of Cases.	
	Natives.	Europeans.		Natives.	Europeans.
			Brought forward	27	6
Aneurysm, aortic ..	2	—	—	—	—
Atelectasis	1	—	Leukaemia ..	1	—
Blackwater fever ..	—	1	Liver, amœbic abscess ..	1	—
Broncho-pneumonia	8	—	,, ruptured ..	1	—
Drowning	2	—	Meningitis	2	—
Dysentery, bacillary	—	2	Peritonitis, general	2	—
Ectopic gestation, ruptured ..	1	—	Phthisis pulmonalis	3	—
Encephalitis lethargica	—	1	Plague, pneumonic	1	—
Empyema, tuberculous	1	—	Pneumonia, lobar ..	1	—
Injuries, gun-shot, &c	7	1	Pyæmia	2	—
,, fractured skull, &c. ..	5	—	Septicæmia ..	4	—
Insanity, delusional	—	1	Tetanus	1	—
Carried forward ..	27	6	Totals ..	46	6

Six of the examinations were of Europeans, and forty-six of natives. The causes of the deaths of the Europeans were bacillary dysentery (2), blackwater fever (1), encephalitis lethargica (1), and exhaustion following delusional insanity (1).

The Collection of Sand-Flies.

Small midges, colloquially referred to as "sand-flies," are regarded as being the intermediate hosts of a number of diseases, such as pappataci fever, three-day fever, pellagra, etc. From all accounts these little pests are common in the Gold Coast, but very little is known about them, and very few have been collected, probably owing to their small size, and the difficulty experienced in capturing them.

In the laboratory at Accra we have found that large numbers of midges—particularly species belonging to the Genera *Phlebotomus*, *Culicoides*, and *Forcipomyia*—may be found on the windows in the evening.

We collect them in the following way. The windows of the laboratory are closed at about 5 p.m. About half an hour later the midges begin to appear on the window-panes, and can be collected until night-fall. To capture them we use small killing tubes which may be made out of a test-tube or any other small glass tube with an even rim. In the bottom of the tube is placed a little cyanide of potash, or a plug of cotton-wool wet with chloroform, over this is placed a dry plug of wool, paper, or cork, and on top of this a disc of white paper. The insects are caught by placing the mouth of the tube over them as they rest on the window-pane or wall, closing the tube by inserting between it and the window-pane or wall a visiting card or anything of the sort, and then lifting it away with the card still in position. The insects when dead should be transferred to a dry tube or to a pill-box containing a little naphthalene and some wool teased into a fine web.

We are anxious to obtain specimens from other places in the Gold Coast, and would be greatly obliged to anyone who would send us some. We are making a special study of some of these midges, and can say already that we have found a number of species new to science. Any small insects seen on windows or walls in the evening would be welcome, especially minute ones. *Culcoides* are dark-grey or black insects about the size of the head of a pin. Specimens taken in the act of biting would also, of course, be very welcome.

A Simple Method for Transporting Mosquito Larvæ.

Mosquito larvæ from out-stations are very much wanted at the laboratory, and will always be gratefully received. The following notes on a simple method of transportation, which may perhaps prove useful, have been drawn up by Dr. Ingram :—

Anyone who has attempted to convey the larvæ or pupæ of mosquitos in their native element to a distance will have noticed how heavy is the mortality, especially amongst pupæ, no matter how great the care exercised to avoid jarring or shaking of the vessels containing them.

The method of transportation employed by Legendre (Review of Applied Entomology, Series B., Vol. IV., p. 49) offers a partial solution of this difficulty so far as larvæ are concerned. The larvæ are removed from water and placed between layers of damp moss and enclosed in a hermetically sealed box. On opening such boxes after five days the larvæ, upon being again placed in water, became active and appeared to develop normall. Legendre's observations show that larvæ can survive out of water and in a closed vessel for at least five days, a fact which greatly facilitates their transport.

A simple modification of Legendre's method has been found efficacious and recommended for use by those who will be kind enough to collect and forward larvæ to the laboratory :—

1. An empty cigarette tin is procured, and after piercing a hole in the bottom, is packed with a layer of absorbent cotton wool to a depth of half an inch.
2. Upon the wool are placed four or five thicknesses of filter-paper or an equivalent number of discs cut from blotting-paper.
3. The water containing the larvæ is then poured upon the filter-paper and allowed to drain away.
4. A few thicknesses of moist filter-paper or blotting-paper are gently packed above the stranded larvæ.
5. The hole in the bottom of the tin is plugged or sealed with sealing wax, plasticene, or a small piece of adhesive plaster, and the lid attached to the tin by a band of adhesive plaster.
6. The data as to date of packing, breeding place, collector's name, etc., are written on the tin, and it is packed up and posted.

It should be noted that this method is useless for stations distant from Accra more than four or five days by post. In the laboratory one or two larvæ have been found to survive for seven days, but they were exceptional. Probably damp moss is preferable to damp filter-paper for packing, and should be used whenever procurable.

For stations so far distant from Accra that the above method is not worth trying, the following may be suggested :—

1. The sample of larvæ is kept in a jar for few days until adult mosquitos have hatched.
2. The adult mosquitos are removed, killed, and placed in a box or tube with a little nephthalene or a drop of creosote and some finely teased wool.
3. The greater part of the water is then poured off from the larvæ and pupæ in the jar, and to the remainder is added an equal volume of five or ten per cent. formalin.
4. The sample is then poured into a suitable bottle or tube, tightly corked, and forwarded together with the adult mosquitos to the laboratory.

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